



Conserve O Gram

July 1993

Number 13/3

Polyester Encapsulation

Polyester encapsulation is a way of sandwiching a paper object between two pieces of stiff, chemically inert, clear plastic. All four edges of the plastic are sealed to hold the paper firmly in place. This technique provides support and protection to fragile or damaged papers which otherwise could not be handled, or which would not receive sufficient protection in a print storage folder. Removing the object requires that the encapsulation be cut open. Other configurations of polyester enclosures are the U-seal (three-sided seal) or the L-seal (two-sided, one corner joined). These enclosures provide somewhat less protection but do allow the object to be extracted without destroying the encapsulation.

Appropriate Uses

Encapsulation is useful for large paper objects such as maps, newspapers, and blueprint drawings that are awkward to handle and susceptible to tearing. This procedure can be used to store brittle or damaged papers before corrective treatment by a conservator. Encapsulation is an excellent way to protect letters or other documents that are handled during research, and which often need both sides visible.

An electrostatic charge, generated by rubbing the plastic sheets, holds fragments of paper in alignment within the encapsulation; however, this will damage friable media such as charcoal, pastel, or flaking watercolor (gouache). Therefore, encapsulation should *not* be used with these objects.

Do not store early gelatin photographs in any kind of polyester folder or envelope. The

unhardened gelatin emulsion may stick to plastic, or may develop shiny spots, called *ferrotyping*. When in doubt about the safety of polyester encapsulation for a paper object, consult a paper conservator.

The Problem of Accelerated Aging

Buffering an acidic paper object before permanent storage in an encapsulation is recommended to slow down the future rate of deterioration. Buffering places a form of magnesium or calcium carbonate into the paper fibers where it neutralizes acids already present. A reserve of buffering agent remains in place to neutralize future acid formation. Buffering should only be performed by, or under the direct supervision of, a paper conservator because it is a complicated interventive treatment.

If buffering is not immediately possible, museum records should note that the object is *encapsulated but unbuffered*. This information also should be included inside the encapsulation in a note written on archival paper. If the document is one-sided, a piece of buffered paper (e.g., Permalife® interleave) slightly larger than the object, can be encapsulated with it. This paper will also provide some buffering benefit. Write the catalog number on the buffered paper in soft pencil and note that there is no information on the reverse side of the object so the encapsulation will not be unnecessarily disturbed in an effort to view the back.

Choosing the Proper Materials

Polyester film used for archival storage must be clear, thick enough to provide support, and contain no plasticizers which will evaporate. It

must not deteriorate with age or release chemicals harmful to papers or media. Two brands considered safe for archival storage are Mylar® Type D and Melinex® 516. They are available from conservation materials suppliers.

Polyester film is sold in both sheets and rolls. Sheets are convenient as a way of standardizing a storage system. The sheets should fit uniformly within storage folders, boxes, drawers, or file cabinets. This prevents small paper objects from being *lost* in a box or drawer with larger objects. However, sheets used for encapsulation can be trimmed to fit the size of the individual object if this is more convenient.

If polyester film is purchased in rolls, each piece of film must be cut from the roll, which is usually difficult to do with precision. However, because many prints and maps are larger than the available pre-cut polyester sheets, a roll of polyester, available in 40" or 60" widths, would be necessary for these objects.

Polyester film is available in several thicknesses; the most common for encapsulation are 3 mil (0.003 inch) and 5 mil (0.005 inch). Film thickness is selected to provide sufficient support to the encapsulated object; this depends on the weight and size of the paper to be encapsulated. Generally, larger papers require heavier films; thinner, lighter papers require thinner gauge films. A box full of documents encapsulated in polyester film can be very heavy, so simply purchasing the heaviest gauge of polyester for all objects may not be the wisest course.

The encapsulation is sealed in one of two ways: with a welding or sealing machine (a very specialized piece of equipment), or with double-sided tape. The recommended tape for archival purposes is 3M® #415 double-sided, polyester transparent tape coated with an acrylic adhesive. The tape has a paper backing which is removed after the two pieces of polyester film are aligned. This *Conserve O Gram* will only describe the use of double-sided tape.

Procedure

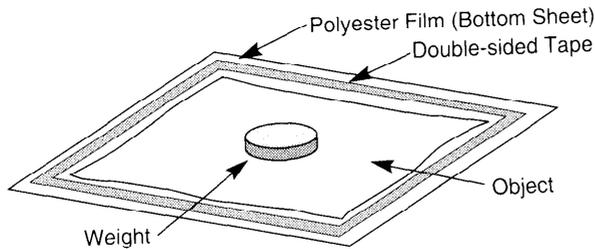
Prepare a clean work space. Assemble the polyester film, double-sided tape, scissors, and a piece of lint-free cotton cloth. A two or three pound, cloth-covered weight will be needed to keep paper and polyester from slipping out of alignment. A ruler or straight edge and a mat knife will be needed if the polyester is to be trimmed. A large sheet of gridded graph paper may be taped to the work surface to aid in laying the tape in straight lines. (Special gridded encapsulation work surfaces are also available from archival materials suppliers.)

Check the object's dimensions to determine if the object is square. The largest *square* dimension is the measurement that is needed. The gridded paper simplifies this step. Place the object on the grids and measure. The square corner of a table or a right angle made from two yardsticks can also be used to assist in determining the square dimensions of an object.

Assembling the Package

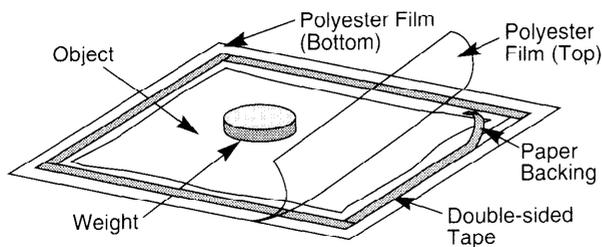
1. Select or cut a piece of polyester film at least 1½" larger in both directions than the paper object to be encapsulated. Lay the polyester film on the work surface and wipe it free of lint with the cloth. Place the weight in the center of the film.
2. Apply the double-sided tape along all four edges of the polyester film. Another technique is to apply the tape on the film so that it is half an inch or so from the edge of the object. The gridded work surface will make this step easier to accomplish with precision. Leave the paper backing on the tape. Remove the weight.
3. Place the paper object within the tape boundaries. Make sure that the object does not touch the tape. If the tape is too close to the object, first remove the object, then remove the tape and reapply it. Replace the

object within the tape boundaries. (It is important *not* to lay the tape with the paper object in close proximity. If the tape should adhere to the paper object, it will need to be removed by a paper conservator.)



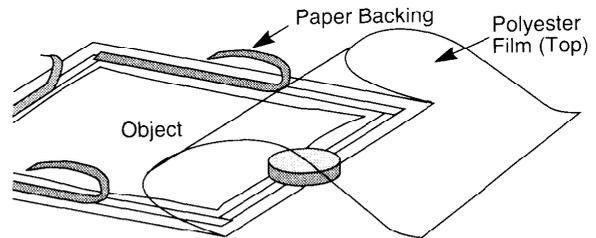
4. Wipe the second piece of polyester film with the clean, lint-free cloth. Lay the film over the object and align all the edges. Place the weight in the center of the package to keep the object and the film from slipping.

5. Lift one end of the top sheet of polyester film and remove the paper backing from the double-sided tape. Gently lay the polyester film back down over the tape. This will anchor one end of the encapsulation package and keep the two pieces of film from slipping out of alignment.

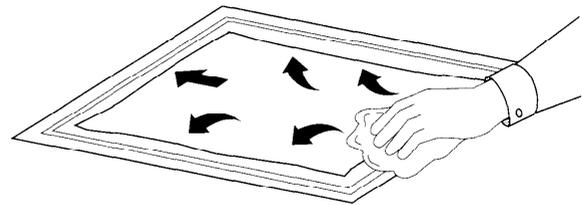


6. Move the weight to the end that is taped together. Lift up the top sheet of polyester film and remove the remaining paper backing from the double-sided tape. Gently lay the

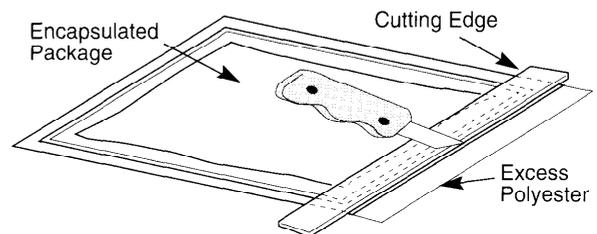
top piece of film back down over the paper object in a rolling motion.



7. Using the cotton cloth and gently pressing in the direction the film is closing, push the air out of the package, starting in the middle of the taped end. Rub the tape until it has completely adhered.



8. If excess polyester needs to be trimmed from around the edges of the encapsulation, lay the ruler or cutting edge on the tape and cut into the margin away from the object. This way, should the knife slip, only the polyester will be cut.



Sources

Materials and tools needed for polyester encapsulation are available from archival-quality materials suppliers, such as University Products, P.O. Box 101, Holyoke, MA 01041-0101, (800) 628-1912; Light Impressions, P.O. Box 940, Rochester, NY 14603, (800) 828-6216; Conservation Resources, 8000-H Forbes Place, Springfield, VA 22151, (800) 634-6932; and Conservation Materials Ltd, P.O. Box 2884, Sparks, NV 89431, (702) 331-0582.

Susan Nash Munro
Paper Conservator
P.O. Box 1011
Shepherdstown, West Virginia 25443

Formerly issued as Conserve O Gram 13/6. Revised 1993.

The *Conserve O Gram* series is published as a reference on collections management and curatorial issues. Mention of a product, a manufacturer, or a supplier by name in this publication does not constitute an endorsement of that product or supplier by the National Park Service. Sources named are not all inclusive. It is suggested that readers also seek alternative product and vendor information in order to assess the full range of available supplies and equipment.

The series is distributed to all NPS units and is available to non-NPS institutions and interested individuals by subscription through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, FAX (202) 512-2233. For further information and guidance concerning any of the topics or procedures addressed in the series, contact the National Park Service, Curatorial Services Division, Harpers Ferry, WV 25425, (304) 535-6410.